Editors:
S. Chen, Nikos Mastorakis, Francklin Rivas-Echeverria, Valeri Mladenov

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Table of Contents

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Plenary Lecture 1

Some Issues Concerning Economic Systems



Prof. Ferenc Szidarovszky
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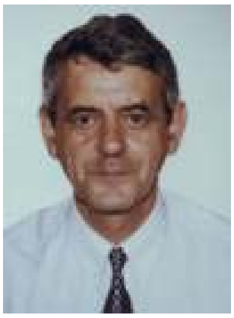
Abstract: An overview will be presented on the major issues concerning economic systems. Based on the most popular model of oligopolies we will first examine the relation between the equilibrium problem of static models and the steady states of dynamic extensions. After the existence of equilibria will be discussed, the asymptotical behavior of dynamic models with discrete and continuous time scales will be examined. Both best response dynamics and gradient adjustment processes will be discussed. We will also show how information delays can effect stability. Several modifications and extensions of the classical Cournot model will be also introduced and studied.

Brief Biography of the Speaker: Prof. Ferenc Szidarovszky :Ph.D. Karl Marx University of Economics, Budapest, May 1977, Institute of Mathematics and Computer Science.| Ph.D. Eotvos University of Science, Budapest, May 1970, Department of Numerical and Computer Mathematics.| M.S. Eotvos University of Science, Budapest, May 1968, Department of Mathematical Analysis. | B.S. Eotvos University of Science, Budapest, May 1966, Department of Mathematical Analysis.
1990-present The University of Arizona, Tucson, Arizona Full Professor, Systems and Industrial Engineering
1988-1990: The University of Arizona, Tucson, Arizona Visiting Professor, Systems and Industrial Engineering. 1987-1988: The University of Texas of El Paso, Texas Visiting Professor, Mathematical Sciences. 1986-1990: Karl Marx University of Economics, Budapest, Professor, Mathematics
Hungary. 1981-1983: The University of Arizona, Tucson, Arizona Visiting Professor, Systems and Industrial Engineering. 1977-1986: University of Horticulture and Food Industry, Professor, Acting Head, Mathematics
Budapest, Hungary and Computer Science. 1972-1977: Eotvos University of Science, Budapest, Hungary Associate Professor, Numerical and Computer Mathematics. 1970-1972: Eotvos University of Science, Budapest, Hungary Senior Lecturer, Numerical and Computer Mathematics. 1968-1970: Eotvos University of Science, Budapest, Hungary Lecturer, Numerical and Computer Mathematics
HONORS AND AWARDS RELATED TO PROPOSAL: Candidate of Mathematical Science, Hungarian Academy of Sciences, 1975. Doctor of Engineering Science, Hungarian Academy of Sciences, 1986. Dr. Habil in Engineering, Budapest Technical University, 1998

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Plenary Lecture 2

Vehicle-Railway Interaction as a Deciding Element In Regards to the Lifetime of Bearing Structures of Railway Vehicles



Prof. Ion Copaci
"Aurel Vlaicu" University,
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ioncopaci@gmail.com

Abstract: Vehicles, under all their forms, have a support that ensures their sustainability and traction as a motive for the appearance of the kinematic element "acceleration" which determines the increase of velocity and the explanation of the means of transport for role and efficiency. The phenomenon also dominates railway transport. The railway vehicle is sustainable on the support offered by the railway which offers excitations in the mechanical system (railway vehicle) which can lead to vibrations and loads of the bearing structures, which determine a lifetime, as a function of the amplitudes manifested as the strain and stress parameters.The link between the railway (in regards to geometrical imperfections and irregularities) and the vehicle is presented in order to establish the lifetime of the vehicle as a function of the quality of the railway and the vehicle's capacity through the elastic elements of the suspension, in order to diminish the fatigue effect and increase the lifetime of the bearing elements of the railway vehicle.

Brief Biography of the Speaker: Ion Copaci graduated from the "Traian Vuia" Polytechnic Institute in Timisoara, Romania, Faculty of Mechanics. He received his Ph.D. in the field of Mechanical Engineering with the thesis „Contributions on the Behaviour of the Bearing Structures of Railway Cars During the Longitudinal Shock Caused by Collision", presented at the "Politehnica" University Timisoara, Faculty of Mechanics, Department of Rolling Stock.
Technical Experience: research in the area of vibrations and shocks on railway vehicles (rolling quality, repeated shock), bearing structure resistance (lifetime, fatigue), elastic elements that equip the suspension or shock insulators of railway vehicles, torsional rigidity and travel safety, quantitative determinations (MATHAR) of the internal stresses on the bearing structures of bogies and Francis turbine rotors. Contributions and experimental research for the promotion on the railway of over 150 freight and passenger railway car prototypes, in almost 30 countries on 5 continents, as a result of over 30 years of research. Nowadays he is a Professor at the Faculty of Engineering of "Aurel Vlaicu" University, Arad, Romania. Field of specialization: Railway Transport Vehicles, with disciplines taught: "Dynamics of Railway Vehicles" and "Experimental Research on Railway Vehicles".
He has published over 120 research papers, 7 books and 4 inventor's licences. He is a member of 6 societies and professional associations and he is a member of the Ukrainian Academy of Science.

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Plenary Lecture 3

Disturbance decoupling for singular systems by state and derivative feedback and state and derivative output injection



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Departament de Matematica Aplicada I
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08038 Barcelona, Spain
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Abstract: The disturbance decoupling problem for linear time invariant singular systems is analyzed. A disturbance may represent modeling or measuring errors, noise, or higher order terms in linearization. We give necessary and sufficient conditions for the existence of a solution to the disturbance decoupling problem with or without stability via a proportional and derivative feedback and proportional and derivative output injection that also makes the resulting closed-loop system regular and of index at most one. All results are based on canonical reduced forms that can be computed using a complete system of invariants that can be implemented in a numerically stable way.

Brief Biography of the Speaker: Professor Dr. Maria Isabel Garcia-Planas joined the Department of Applied Mathematics at the “Universitat Politecnica de Catalunya” Barcelona, Spain in 1981. Her work had been centred on Linear Algebra, Systems and Control Theory. She has authored over eighty papers and serves on the referee on several journals. She has been plenary Speaker in WSEAS Int. Conf. on Applied and Theoretical Math, Vravrona, Grecia (2000), WSEAS International Conference SIM'01, Qawra, Malta, (2001), 6th WSEAS CSCC, Creta, (2002), 4th WSEAS-ISTACS. Puerto de la Cruz, (2004), 8th WSEAS Int. Conference on Applied Mathematics, Puerto de la Cruz, (2005), 11th WSEAS Int. Conf. on Systems, Creta, (2007), Applied Computing Conference, Istanbul Turkey, (2008).

Plenary Lecture 4

Mathematical modeling of forest fire initiation problem in three dimensional setting



Prof. Valeriy Perinov
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Abstract: Mathematical model of forest fire was based on an analysis of known experimental data and using concept and methods from reactive media mechanics. In this paper the assignment and theoretical investigations of the problems of crown forest fire initiation in windy condition were carried out. The investigation takes in to account the mutual interaction of the forest fires and three dimensional atmosphere flows. The research is done by means of mathematical modeling of physical processes. It is based on numerical solution of Reynolds equations for chemical components and equations of energy conservation for gaseous and condensed phases. It is assumed that the forest during a forest fire can be modeled as a two-temperature multiphase non-deformable porous reactive medium. The boundary-value problem is solved numerically using the method of splitting according to physical processes. A discrete analog for the system of equations was obtained by means of the control volume method. The developed numerical model of forest fire initiation and spreading would make it possible to obtain a detailed picture of the variation in the velocity, temperature and chemical species concentration fields with time. Mathematical model and the result of the calculation give an opportunity to evaluate critical conditions of the forest fire initiation and spread which allows applying the given model for of means for preventing fires. The model overestimates the rate of the crown forest fires spread. The results obtained agree with the laws of physics and experimental data.

Brief Biography of the Speaker: Prof Vlariy Perminov received his Diploma in Mathematics, from Kemerovo State University in 1981. He was an assistant of the department of High mathematics, Kemerovo Technological Institution in 1981. 1982-1983: A probability student of physical mechanics department of Tomsk State University. 1984-1987: A post-graduate student of physical mechanic department of Tomsk State University. 1988-1995: Senior research worker of physical mechanics department of Tomsk State University. 1995-1996 : Assistant Professor of physical mechanics department at the faculty of mechanics and mathematics of the Tomsk State University. 1997 - 2009 - Deputy Director and Lecture, Belovo Branch of Kemerovo State University.2009 - up to now - Lecture, Belovo Branch of Kemerovo State University. He is Member of the Council on combustion and explosion of Siberian Department of Russian Academy of Science He took part in Russian and international grants:
1990-1996 - Mathematical modeling of forest fires (Universities of Russia), Mathematical modeling of environment pollution by motor transport and etc.
1994-1995 - “A mechanics of reactive media and mathematical theory of forest fires”. (Grant of International Science Foundation N J69100).
1999 – 2001 - “Mathematical modeling of ecological consequences of forest fires”(Grant of Russian Foundation for Basic Research N98-01-03013).
2006 - Grant of Russian Foundation for Basic Research N 06-01-10839).
2007 – 2008 “Mathematical modeling of initiation and development of mass forest fire” (Grant of Russian Foundation for Basic Research N 07-01-96047).
2009 - Grant of Russian Foundation for Basic Research N 09-01-08207). He is author of more than 100 papers in international journals and conferences

Plenary Lecture 5

Heavy metals behaviour in a gasification reactor



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Abstract: Sludge coming from cleaning processes of waste-water, Municipal Solid Waste (MSW), and Refuse Derived Fuel (RDF) can be exploited for producing energy because of their heating value. cleaning the produced syngas is important because of environmental troubles, which are possible if the concentration of noxious compounds is higher than the one fixed by law. Besides, noxious compounds erode the turbine in producing electric energy and both temperature and injected gas speed make this erosion heavier.
Two-stage reactor of gasification is resulted able to produce a clean syngas in spite of the presence of PVC or other organic compounds containing sulphur or chlorine in the feeding blend, directly. The thermodynamic analysis could be an useful tool for indicating the best way for optimising the performance of the two-stage gasifier with respect on the heavvy metals residues into the produced syngas,taking the presence of a Ni catalyst into account. The main results indicate that preheating is not efficient because not all the heavy metals evaporate during this process because the temperature can not exceed 300 °C to prevent any premature cracking of the feeding blend.

Brief Biography of the Speaker: Doctor Martino Paolucci is born in Roma Italy on may 19, 1946. He was graduated, industrial chemistry degree, at Roma university “La Sapienza”, 1971. At present he is working at Ispra (Institute for protection and environmental research), Roma - Italy . His experience involves renewable and conventional energy; bio-fuels; industrial gas; hydrogen production; thermal and solar reforming. This experience was developed working in chemical research laboratories of mines (industry ministry), in 1976-1980; thermodynamic centre for high temperature – chemical department of Roma University “La Sapienza”, in 1980-1993; optimisation of technical-economic analysis for pyrolysis and processes of poor fuels, and civil organic wastes, rural , Science Faculty Roma University Roma 3”, in 1994-2003; innovative gasification development for biomass, Department of chemical engineering of Roma University “La Sapienza” ”Roma 3”, 1994-2003; optimisation of a reactor at two stage with poly-biomass (rural, industrial and civil waste) to the tar content. He is continuing the above-mentioned studies in Ispra, with Department of chemical engineering and Chemical Department of Roma University “La Sapienza”. The results of his research work are published in different papers and in different proceedings of congresses.

Plenary Lecture 6

Critical success factors for sustainable manufacturing: Evidence from Indian manufacturing organizations



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Abstract: With growing awareness of environmental issues – from global warming to local waste disposal and pollution problems – business and government have come under increasing pressure to reduce the environmental impacts involved in the production and consumption of goods and services. However, organizations consider environmental assessment fairly late in the product development process, which generates additional design constraints and increases the development costs. However, the integration of environmental requirements through life-cycle stages of a product is a likely approach, leading to a new paradigm of sustainable manufacturing. Because of the lack of sustainable critical success factors, judgments about sustainable manufacturing have become costs in ethical or moral terms. Therefore, there is a strong need to develop critical success factors for sustainable manufacturing so that these systems/practices can be evaluated and justified for either continuous improvement or implementation by practitioners and academicians. In this paper, critical success factors for sustainable manufacturing have been developed based on a survey of manufacturing industries in India. The critical success factors have been validated using a statistical tool.

Brief Biography of the Speaker: Dr. Kuldip Singh Sangwan is a senior faculty of Mechanical Engineering and also the Unit Chief of Workshop Unit of BITS, Pilani. He has over 17 years teaching experience at graduate and post graduate levels. He has published a book on concurrent engineering where a cradle to grave concept of product design and development is illustrated. He has published many research papers in national and international journals in the field of green manufacturing, environmentally conscious design and production, world class manufacturing, cellular manufacturing, etc. Currently, Dr. Sangwan is guiding 5 PhD students in the area of reverse logistics, environmentally conscious design and manufacturing where the product life cycle and end-of-life strategies are taken care at the time of product design (sustainable product design and development). His areas of research interest are sustainable Manufacturing, World-class Manufacturing, TPM, CMS, Concurrent Engineering, Operations Management, and application of Fuzzy Mathematics, Genetic Algorithms, Simulated Annealing, and Neural Networks in design of manufacturing system.

Plenary Lecture 7

On Educational system managing



Prof. Eugeny Smirnov
Department of Mathematics,
Yaroslavl State Ped. University, Russia
smiei@mail.ru

Abstract: Problem solving of educational system managing is strong depended from the mobility and efficiency of feedback (getting of information base of activity) as well as the adequateness of ideal model of managing (oriented base of activity) to real educational process. Visual modeling of managing process and data bases in teaching of mathematics of future engineer mean the creating of ideal mathematical and information models of learning and their adequateness (success of process managing) to educational results and process of approximated models and data bases improving using Web-technologies and small resources of informatization. We will construct the entire didactical model of teaching mathematics of future engineer including semantics, informatics and mathematics.

Brief Biography of the Speaker: Professor Eugeny I. Smirnov is Professor in the Department of Mathematics, Yaroslavl State Pedagogical University, Respublikanskaya, Russia. He has 2 Ph.D Diplomas / Dissertations:
a) Didactical System of Mathematical Education of Teachers. Defended in 1998 (Ph.D. Hab. in Education) and b) Souslin Limit of Topological Vector Spaces and its Applications. Defended in 1979 (Ph.D. in Mathamatics). He is currently supervisor of 16 Ph.D. students. Prof. Smirnov has many papers in international journals and conferences.
His research interests are:
The theory of Hausdorff spectra and its applications to theory of measure, functional analysis, pseudotopology, spaces of distributions, partial differential equations.
Determination of the contents and technology of mathematics education , expected during 1998-2009.
Visual methods of teaching applying to mathematics (International Projects-IPMA(England), MISE(Netherlands), MISL(Netherlands).
Theory of binary games, computer programs on Go and Go-moku. Articles of computer programs on graphical calculator, computer algebra system, Web-technologies.
Teaching:
Yaroslavl State Pedagogical University. Department of Mathematics. Assistent Professor. 1976-1981.
Yaroslavl State Pedagogical University. Department of Mathematics. Associate Professor. Head of the Department. 1983-1993.
Yaroslavl State Pedagogical University. Department of Mathematics. Professor. Head of the Department. 1995 up to current period.
Courses Taught: calculus, visual methods of teaching mathematics, mathematical modeling, using of information technology in math.teaching, mathematical analyses, the game theory, functional analyses, theory of measure, complex analyses, differential equations in locally convex spaces.

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Authors Index